

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Brij Bahadur Agrawal, et al.

Serial No.: 09/804,993

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Group Art Unit.1764

Examiner: James Arnold Jr.

For: PROCESS FOR THE FIXED BED SWEETENING OF PETROLEUM
DISTILLATES USING HALOGENATED METAL PHTHALOCYANINE AS A
CATALYST

Attorney Docket No. U-013307-3

RESPONSE UNDER 37 CFR 1.116
- EXPEDITED PROCEDURE -
EXAMINING GROUP 1642

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RESPONSE TO TELEPHONE NOTICE OF BONA FIDE BUT NON-
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Listing of Claims

1. (currently amended) A process for fixed bed sweetening of petroleum distillates using a dichloro- or dibromo- cobalt or iron halogenated-metal phthalocyanine as a catalyst which comprises impregnating the catalyst on an activated charcoal bed by circulating an alcoholic alkaline solution of the catalyst through said activated charcoal bed until a colourless solution is obtained in the effluent, thereby obtaining a catalyst impregnated charcoal bed, passing the petroleum distillate through said catalyst impregnated charcoal bed along with air or oxygen at a temperature in the range 20°C to 100°C at a pressure in the range 1 kg/cm² to 15 kg/cm² with a liquid hourly space velocity in the range 1 hr⁻¹ to 15 hr⁻¹ with continuous or intermittent injection of alkali solution of concentration in the range 0.5 - 20%, to obtain the desired low mercaptan level petroleum distillates
2. (Previously presented) A process as claimed in claim 1, wherein the alcoholic alkaline solution used is selected from methanolic and ethanolic solution of sodium hydroxide.
- 3 (currently amended) A process as claimed in claim 1 wherein said ~~halogenated-metal~~ phthalocyanine catalyst used is selected from dichloro cobalt phthalocyanine and dibromo cobalt phthalocyanine.
4. (currently amended) A process as claimed in claimed in claim1 wherein the concentration of catalyst used in the fixed bed is in the range 0.1 wt% to 1 wt% of activated charcoal.
- 5 (currently amended) A process as claimed in claim 1, wherein ~~the halogenated-metal~~ said dichloro- or dibromo- cobalt or iron halogenated-metal phthalocyanine is prepared by treating the cobalt or iron

phthalocyanine with a halogenating agent selected from the group comprising chlorine, bromine, iodine, thionyl chloride, sulphuryl chloride, phosphorus pentachloride, phosphorus oxychloride, phosphorus pentabromide and phosphorus trichloride.

- 6 (Previously presented) A process as claimed in claim 1, wherein the petroleum distillate used is selected from diesel, kerosine and FCC gasoline.
- 7 (Previously presented) A process as claimed in claim 1 wherein the temperature is about in the range 20°C to 50°C.
- 8 (Previously presented) A process as claimed in claim 1, wherein the pressure is about in the range 5 kg/cm² - 8 kg/cm².
- 9 (Previously presented) A process as claimed in claim 1, wherein the liquid hourly space velocity (LHSV) is about in the range 1 hr⁻¹ to 6 hr⁻¹.
- 10 (Previously presented) A process as claimed in claim 2, wherein said ~~halogenated metal phthalocyanine~~ catalyst used is selected from dichloro cobalt phthalocyanine and dibromo cobalt phthalocyanine.
11. (Previously presented) A process as claimed in claim 2, wherein the concentration of catalyst used in the fixed bed is in the range 0.1 wt% to 1 wt% of activated charcoal.
12. (Previously presented) A process as claimed in claim 3, wherein the concentration of catalyst used in the fixed bed is in the range 0.1 wt% to 1 wt% of activated charcoal.
13. (Currently amended) A process as claimed in claim 2, wherein the ~~halogenated metal~~

said dichloro- or dibromo- cobalt or iron halogenated metal phthalocyanine is prepared by treating the cobalt or iron phthalocyanine with a halogenating agent selected from the group comprising chlorine, bromine, iodine, thionyl chloride, sulphuryl chloride, phosphorus pentachloride, phosphorus oxychloride, phosphorus pentabromide and phosphorus trichloride.

14 (Currently amended)

A process as claimed in claim 3, wherein ~~the halogenated metal~~ said dichloro- or dibromo- cobalt or iron halogenated metal phthalocyanine is prepared by treating the cobalt or iron phthalocyanine with a halogenating agent selected from the group comprising chlorine, bromine, iodine, thionyl chloride, sulphuryl chloride, phosphorus pentachloride, phosphorus oxychloride, phosphorus pentabromide and phosphorus trichloride.

15 (Currently amended)

A process as claimed in claim 4, wherein ~~the halogenated metal~~ said dichloro- or dibromo- cobalt or iron halogenated metal phthalocyanine is prepared by treating the cobalt or iron phthalocyanine with a halogenating agent selected from the group comprising chlorine, bromine, iodine, thionyl chloride, sulphuryl chloride, phosphorus pentachloride, phosphorus oxychloride, phosphorus pentabromide and phosphorus trichloride.

16. (Previously presented)

A process as claimed in claim 2, wherein the petroleum distillate used is selected from diesel, kerosene and FCC gasoline.

17 (Previously presented)

A process as claimed in claim 2, wherein the petroleum distillate used is diesel.

- 18 (Previously presented) A process as claimed in claim 2, wherein the petroleum distillate used is FCC gasoline.
- 19 (Cancelled)
- 20 (Cancelled)
- 21 (Previously presented) A process according to claim 1, wherein said injected alkali solution comprises sodium hydroxide.
- 22 (New) A process as claimed in claim 1 wherein said dichloro- or dibromo- cobalt or iron phthalocyanine is unsulfonated.
- 23 (New) A process as claimed in claim 1 wherein said dichloro- or dibromo- cobalt or iron phthalocyanine is insoluble in alkali or hydrocarbon during the sweetening process.